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DOSE-DEPENDENT EFFECT OF AQUEOUS EXTRACT OF *JATROPHA TANJORENSIS* (CHAYA) LEAF ON BIOCHEMICAL MARKERS IN MALE WISTER RATS

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Abstract: **Many traditionally known medicinal plants studied in the last few decades have been reported to possess various medicinal properties such as anticancer activity, antioxidant activity, anti-inflammatory, anti-diabetic, antibacterial, antifungal and hepato-protective activities. This study aimed to evaluate the effect of aqueous extract of dose- dependent *Jatropha tanjorensis* (chaya) leaf on biochemical parameters of male wistar rats. Total of forty (40) male wister rats weighing 130-150g (about 12 weeks old) were grouped into five groups of 8 rats each, (group A to E), Group A served as negative control (just water and feed only),while Group B (Low dose of Jatropha tanjorensis,200mg/kg),Group C (Medium dose of *Jatropha tanjorensis* ,400mg/kg), Group D, (High dose of Jatropha tanjorensis, 600mg/kg), Group E (Positive control ,just folic acid drugs and feed only). Biochemical parameters were accessed. The study findings revealed that the aqueous extract of *Jatropha tanjorensis* leaves, when administered to the experimental rats, showed a significant decrease in serum creatine levels in treatment groups B, C, and D. As well as in AST, ALP and ALT levels increased in all the groups(P<0.05).**

Keywords: **Biochemical, Extract, Jatropha tanjorensis, Medicinal, Wistar rats.**

1. INTRODUCTION

Medicinal plants are key sources of bio-active compounds for herbal medicine, antibiotics, antioxidants, and pharmaceutical drugs(Tiwari ***et al.,***2011). There is virtually no plant on earth without any health benefit; however, there are many plants yet to be discovered health benefits. Their bio-active constituents can be used in whole or as extracted forms for the management of ailments due to the available findings that they possess little or no side effects, readily available and can protect humans against many diseases(Tiwari ***et al.,***2011).

The aim of this study is to determine the effect of aqueous extract of *Jatropha tanjorensis* on liver markers (Aspartate aminotransferase, alanine amino transferase, alkaline phosphatase, direct bilirubin, total bilirubin) function. As well as to evaluate the effect of aqueous extract of Dose Depended *Jatropha tanjorensis* leaf on the kidney function test(Urea and Creatinine).

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2. MATERIALS AND METHODS

Location

This Study was conducted in the Animal House of the Department of Human physiology, Faculty of Basic Medical Sciences, College of Medicine and Health Sciences, Abia State, Uturu.

Materials

Jatropha tanjorensis Leaf and forty (40) male wistar rats, weighing balance, Latex Medical Gloves, Penand Paper**,** Ethylenediamine tetraacetic acid (EDTA) bottles, Feeding Trough**,** Needle and Syringes (2ml, 5ml), Vital feed rat chow (Finisher Mash for Rats, Chikun Feed, Ibadan, Oyo State, Nigeria), tap water and distilled water. Calculator (FX 991ESPLUS; Casio) Paper tape and markers, Chloroform, Centrifuge, Test tube racks, Electric blender (SharkNinja, BL(660, China), Gavage and syringe, Spectrophotometer (Shanghai Yoke Instrument Co., Ltd. China), Cotton wool, Drugs(diazepam)

Extract Procedure

The leaves were washed thoroughly and aired-dried at room temperature. The dried leaves were ground into powdered form using electric blender. Extraction of leaf was done by cold maceration according to the method described by Hossain et al. (2013) and Evbuomwan et al. (2015). About 500 g of ground leaves were soaked into 4000 mL of ethanol and the solution was macerated for about 24 hrs with gentle shaking at 360 rpm until the soluble matter had properly dissolved. After extraction, the solution was clarified by filtration under vacuum using Whatman filter paper and the ethanol solvent evaporated completely using a rotary evaporator. The solvent free ethanol crude extract was suspended in diethyl ether to purify the extract after which it was exposed to the atmosphere for a while to ensure elimination of the solvent odour. The extracts obtained were then weighed and refrigerated till they were used

Experimental Design

40 male Wister rats were randomly grouped into five groups of 8rats each as follows;

Group A: Negative control (no extract, just water and feed).

Group B: Low dose of *Jatropha tanjorensis* (200mg/kg)

Group C: Medium dose of *Jatropha tanjorensis* (400mg/kg)

Group D: High dose of *Jatropha tanjorensis* (600mg/kg)

Group E: Positive control (no extract, just folic acid drugs and feed)

All experimental protocols were observed under strict supervision, the experiment lasted for 6-weeks, and administration was done through oral gavage.

Statistical Analysis

The data generated in this study were statistically analyzed using the SPSS version 23 software. Means and standard errors of mean will be calculated. Statistical differences between the experimental and control groups were determined using ANOVA and values were considered significant at $p \leq 0.05$.

3. RESULTS

Table I: Effect of aqueous extract of *Jatropha tanjorensis* leaves on serum urea and creatinine level

Groups (N=5)	Creatinine (µmol/l) MEAN□SEM	Urea (mmol/l) MEAN□SEM
Group A (control)	3.71□0.17	32.33□0.33
Group B (200mg/kg of AJTL)	3.37□0.01 [a,#]	34.33□0.33[b,*]
Group C (400mg/kg of AJTL)	3.20□0.01 [a,#]	35.67□0.33[b,*]
Group D (600mg/kg of AJTL)	3.18□0.00 [a,#]	35.47□0.03[b,*]
Group E (5 mg/kg of folic acid)	3.17□0.04 [a]	34.28□2.99[a]
p-value	0.004	0.000
F-value	8.092	15.989

Data was analyzed using ANOVA followed by post Hoc LSD multiple comparison and values were considered significant at $p<0.05$. SEM: Standard error of mean, significant (^{a}) and not significant (^{b}) when compared to A; *: significant and #: not significant when compared to E, AJTL: aqueous extract of Jatropha tanjorensis leaves

Table I result revealed a significant decrease in the serum mean creatinine in groups B, C, D, and E (p=0.013, p=0.001, p=0.001, p=0.001) compared to group A. However, groups B, C, and D (p=0.122, p=0.865, p=0.955) had a non-significant increase in the serum creatinine levels when compared to group E. The serum urea level showed a non-statistically significant increase in groups B, C, and D (p=0.324, p=0.115, p=0.135) while group E (p=0.000) had a significant increase when compared to group A. However, groups B, C, and D (p=0.000, p=0.010, p=0.011) had a significant decrease in the serum urea level when compared to group E.

Table II: Effect of aqueous extract of *Jatropha tanjorensis* leaves on AST, ALT, and ALP Level

Groups	AST level (U/L) Mean□SEM	ALT level (U/L) Mean□SEM	ALP level (U/L) Mean□SEM
Group A (control)	21.48□0.00	55.72□0.01	41.92□0.03
Group B (200 mg/kg of AJTL)	32.72□0.03 ^{a*}	53.52□0.01 ^{a,*}	84.93□1.33 ^{a,*}
Group C (400 mg/kg of AJTL)	47.65□0.03 ^{a,*}	58.62□0.01 ^{a,*}	156.26□0.05 ^{a,*}
Group D (600 mg/kg of AJTL)	73.51□0.03 ^{a,*}	76.28□0.01 ^{a,*}	166.47□0.05 ^{a,*}
Group E (5 mg/kg of folic acid)	29.50□1.94 ^{a}	17.79□1.44 ^{a}	103.94□8.92 ^{a}
p-value	0.000	0.000	0.000
F-ratio	**558.413**	**1102.188**	**162.927**

Table II result showed a significant increase in the mean AST level in groups B, C, D, and E (p=0.001, p=0.000, p=0.011, p=0.001) when compared to group A. However, groups B, C, and D revealed a significant (p=0.025, p=0.002, p=0.001) increase in serum AST level when compared to group E. The ALT result showed a significant decrease in groups B and E (p=0.036, p=0.000) while groups C and D (p=0.009, p=0.000) had a significant increase when compared to group A. However, comparison to group E showed a significant increase in the serum ALT levels compared to groups B, C, and D (p=0.000, p=0.000, p=0.001). The ALP result revealed a significant increase in groups B, C, D, and E (p=0.001, p=0.000, p=0.012) when compared to group A. The ALP result showed a significant decrease in-group B (p=0.008), while groups C and D (p=0.010, p=0.001) had a significant increase compared to group A.

4. CONCLUSION

The study findings revealed that the aqueous extract of *Jatropha tanjorensis* leaves, when administered to the experimental rats, showed a significant decrease in serum creatine levels in treatment groups B, C, and D. Also, the study reported that urea had no significant change in treatment groups B, C, and D following the aqueous extract of *Jatropha tanjorensis*. Chibuogwu *et al*.,2021 reported no significant difference in the serum urea level following *J. tanjorensis*, which agrees with the study findings.

The study findings demonstrated a significant increase in the AST levels in treatment groups B, C, and D compared to control. However, the works of (Amaechi ***et al.,***2022), **(**Oladele *et al.*,2020**)** and (Tarfa,, Toryila, & Danborno,2021) demonstrated significantly higher levels of AST following *J. tanjorensis*, which agrees with the study findings.

The study revealed that administration of the aqueous extract of *Jatropha tanjorensis* leaves indicated a significantly higher mean of ALP and ALT activities. This agrees with the findings of Nwankwo *et al*.,2025 who reported increased ALP concentration following ibuprofen treatment. (Tarfa, Toryila, & Danborno,2021) demonstrated significantly higher levels of ALT following *J. tanjorensis*, which agrees with the study findings.

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